

REMARKS

Summary of Changes Made

Claim 1 has been amended to recite glass frit and crystal seed powder in the material forming the coating, and to add both a firing step and a bending step, which is the subject matter of claims 2 and 3. Claims 2-6 have been canceled without prejudice. Claim 8 has been amended to correct an antecedent basis issue thus far unnoticed. Claims 12 and 13 have been amended to correct dependency. Claim 18 has been amended to correct punctuation. The specification, at paragraph 30, has been amended to correct a grammar issue. No new matter has been added to the application. Accordingly, claims 1 and 7-19 (14 claims) remain pending in the application.

Claim Rejections - 35 U.S.C. §103(a) (Heyman in view of Axtell)

First, the Examiner rejected claims 1-2 and 8-16 under 35 U.S.C. 103(a) as unpatentable over Heyman et al, U.S. 4,327,283 ("Heyman"), in view of Axtell, III, et al., U.S. 6,238,847 ("Axtell"). The Examiner asserts that Heyman teaches marking by laser ablation of coating layers, which may have been applied by screen-printing to glass substrates. The laser ablation exposes markings. The Examiner asserts that the layers may consist of glass frit and pigments that are fired to make them permanent after laser ablation. The Examiner admits that Heyman does not disclose the content and form of the markings, but holds it obvious that any information may be marked by means of laser ablation. The Examiner also points out that Heyman discloses: pigmented frits or silicate coatings; glass workpieces; and, the firing of a coating after laser ablation to make it permanent. The Examiner admits that compositional proportions of frit glass and pigments are not disclosed, but concludes that it would be obvious to determine an optimum frit composition suitable for screen-printing on a particular substrate.

The Examiner further asserts that the underlayer of Heyman reads on the second coating in instant claim 10, and the overcoat of Heyman reads on the claimed ablation portion, which prevents ablation or damage to the substrate. The Examiner admits that Heyman does not disclose a particular type of laser, but concludes that the choice of laser

is obvious to one of skill in the art knowing the substrate to be marked.

The Examiner next admits that Heyman discloses only a cathode ray tube as a glass substrate, but concludes that such disclosure suggests any commonly manufactured glass as a substrate. Further, the Examiner cites Axtell as suggesting that automotive glass may be labeled, hence it would have been obvious to one of ordinary skill in the art to mark automotive glass as disclosed by Axtell using Heyman's technique.

With respect to the recitation of crystal seed powder in the claims, the Examiner asserts that none need be present. Further, the Examiner asserts that the Heyman disclosure of the inorganic silicates is consistent with the meaning established in the parent case.

As an initial matter, it appears that some of the rejections presently levied are identical to those levied in the parent case and do not squarely address the current scope, subject matter and language of the currently pending claims. One example is the Examiner's contention that "while Heyman et al (283) does not discuss 'crystal seed powder' in the claims, none need be present (zero weight %)," (Office Action 1, 12/17/2004, p. 4). The paragraph containing that quote is reproduced substantively verbatim from the Office Action mailed 11/10/2003, page 3, in the parent case, 09/941,363. That rejection does not properly address any currently pending claim.

The Examiner will note that claim 1 has been amended, and now recites a method of providing indicia on a piece of automotive glass comprising: (a) screen printing the automotive glass with a single layer of material having a thickness to form a coating on the glass, wherein said material comprises glass frit and crystal seed powder, (b) laser ablating a portion of the coating using a laser, to provide the indicia on the automotive glass, wherein at least a portion of the thickness of the coating is removed during the laser ablating, and wherein none of the automotive glass is removed or damaged during the laser ablating, (c) firing the automotive glass, and (d) applying a forming pressure to the glass to bend the glass during firing.

The combination of Axtell and Heyman fails to disclose all of the elements of claim 1, as amended. First, the Heyman reference is not properly cited by the Examiner. In particular, the Examiner attempts to equate the inorganic silicates broadly disclosed in Heyman to the crystal seed powder instantly claimed in amended claim 1. Heyman is non-

analogous art as it concerns marking a cathode ray tube for a television. No one skilled in the art would look to Heyman for guidance on coating and laser ablating an automotive windshield.

Claim 2 has been canceled, rendering moot the rejection thereof.

Further, the Examiner's contention that, with respect to crystal seed powder "none need be present" is erroneous. Claim 16, as originally filed, recites "crystal seed powder" with no limitation as to amount, hence some amount is required, which distinguishes the claim from the cited prior art in any combination. Further still, claim 1 as presently amended, recites the presence of crystal seed powder, similarly distinguishing it over the cited prior art.

Additionally, merely because Heyman discloses "a coating including an inorganic silicate with a main body of glass whereby upon suitable heating or firing, the silicates of the coating and the body integrate with one another," (Heyman, sentence bridging cols. 3-4), does not mean that Heyman comprehended crystal seed powder (i.e., crystallizing frits), as previously defined herein: "a powder comprising crystalline particles which facilitate crystallization and solidification of the screen printed material during the firing operation," (09/941,363 application, Amendment A, 8/6/03, p. 9, para. 2)

Merely "integrating with one another" does not necessarily mean that crystallization has occurred. There is no reason to believe that upon the issue of the Heyman patent in 1982 that an "inorganic silicate" was present for the purpose of seeding crystallization. The broad disclosure in Heyman of "inorganic silicate" encompasses crystalline and non-crystalline materials, but provides no indication that crystallization is actually occurring or desirable. Beginning with the Heyman and Axtell references, far more than routine experimentation would be needed to determine the desirability of crystallization as well as the "inorganic silicates" necessary to initiate it. It is likely that the Heyman inorganic silicate was used as a flux, and not as a facilitator of crystallization or solidification.

The Axtell reference is similarly non-analogous art. Axtell discloses a process whereby a special marking material is fused to a substrate by means of a laser to create a raised mark. The present invention claims a method of marking a piece of automotive glass whereby a green coating is built up on a glass substrate, a portion of that green coating is removed from the substrate by laser ablation, the remainder of the green coating

is fused by firing the coated substrate, and the substrate is bent during firing.

More particularly, the Axtell reference discloses essentially the reverse of the presently claimed method. Axtell coats an article with a fusible marking material, subjects it to a laser beam, which fuses a relatively small portion of the fusible marking material to the article, and then removes the excess (non-fused) marking material to leave a raised mark, (Axtell, col 2, l. 64 - col 3, l. 27; Figs 3a-3c, 4a-4c). In stark contrast, the present invention involves screen printing a coating onto a relatively significant portion of a glass substrate (automotive glass), laser ablating to remove a relatively small portion of the coating to provide indicia, firing the substrate bearing the coating and bending the automotive glass during firing. Stated more simply, Axtell adds material by fusing it to a substrate by heating it with a laser, while the instantly claimed method removes added material by vaporizing it with a laser. Inasmuch as Axtell is non-analogous art, it does not form a proper basis for the instant 35 U.S.C. 103(a) rejection.

Because both Heyman and Axtell are non-analogous art, neither forms a reasonable basis for a rejection of the pending claims. As such, there is no motivation to combine the references, and their combination fails to disclose all of the elements of claims 1 and 8-16.

For all of the above reasons, plus the ultimate dependency of claims 8-16 on claim 1, Applicants assert that claims 1 and 8-16 are patentable over the cited prior art and respectfully request the Examiner to revisit her conclusions leading to the instant rejection.

Claim Rejections - 35 U.S.C. §103(a) (Heyman in view of Axtell and Boaz)

Next, the Examiner rejected claims 3-7 under 35 U.S.C. 103(a) as being unpatentable over Heyman et al., in view of Axtell, as discussed above, and in further view of Boaz, U.S. 4,477,486 ("Boaz"). The Examiner admits that the combination of Heyman and Axtell does not disclose the shaping of glass and cites Boaz as disclosing: that the perimeter of a glass windshield may be coated with a ceramic containing material, heat fused after patterning; that a windshield can be bent after a pattern is applied and in combination with the fusing operation; and that it is desirable to coat the periphery of a windshield to hide unsightly portions of the windshield.

The Examiner concludes that it would have been obvious to combine the Heyman and Axtell teachings (that bending during firing is desirable) with the Boaz teachings (that

fusible material can be used to coat or mark similar substrates). Further, the Examiner notes that all three references teach firing to fuse after patterning, with Boaz suggesting both that the firing and bending operations can be combined, and that it is desirable to coat a windshield in a particular area.

First, the Examiner will note that claims 3-6 have been canceled rendering moot their rejection. Applicants point out that the subject matter of claims 2 and 3 has been incorporated into claim 1 as amended. It is believed that the argumentation distinguishing claim 1, above, alone serves to distinguish it over the combination of Heyman, Axtell and Boaz because that combination fails to disclose all of the elements of claim 1. Claim 7 depends from claim 1, as amended, and based on the asserted patentability of claim 1, Applicants assert that claim 7, as written, is similarly patentable. The Applicants invite the Examiner to revisit her conclusions leading to the instant rejection of claims 3-7.

Claim Rejections - 35 U.S.C. §103(a) (Heyman in view of Axtell and Sakoske)

Finally, the Examiner rejected claims 7 and 16-19 under 35 U.S.C. 103(a) as being unpatentable over Heyman in view of Axtell and in further view of Sakoske, U.S. 5,783,507 ("Sakoske"). The Examiner, while noting that Heyman and Axtell both disclose pigmented silicate frit materials, for coating glass substrates and laser treating, admits that they do not disclose the use of bismuth silicate, zinc silicate or zinc borate crystal seed material.

The Examiner cites Sakoske as teaching a glass frit ceramic enamel suitable both for screen-printing and for coating the periphery of automotive glass. The Examiner asserts that Sakoske discloses the use of the instantly claimed material in ranges overlapping with those instantly claimed. The Examiner concludes it would have been obvious to use the Sakoske frit composition in the manner taught by the combination of Heyman and Axtell.


The Applicants reassert all previous argumentation with respect to claims 1 and 7 as if fully reproduced here. Because the combination of Heyman and Axtell is improper, the addition of Sakoske does not cure that defect. Again, Axtell is essentially the opposite of the presently claimed process. Based on the foregoing, the Applicants respectfully assert that claims 7 and 16-19 are patentably distinguishable over the cited prior art.

CONCLUSION

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge the same to our Deposit Account No. 06-0625, our Order No. FER-15313.002.

Respectfully submitted,
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